
UEENEED1zzA**Install, Configure and Manage Energy Sector Virtual Server Environments****Unit Descriptor****1)****1.1) Descriptor**

This unit covers installing, configuring, and managing energy sector virtual server environments. It encompasses safe working practices, the installation, configuration and management of virtual server components, networking in a virtualised environment, migration of virtual machines, managing the virtual server infrastructure, monitoring resource usage, planning for scalability, managing updates, managing higher availability and data protection, and documenting all installation, configuration and management activities.

Note:

This unit applies to all aspects of Electrotechnology – engineering applications only. For general competencies related to Information Technologies refer to the latest endorsed IT Training Package.

1.2) License to practice

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Prerequisite Unit(s)**2)****2.1) Competencies**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE101A Apply Occupational Health Safety regulations, codes and practices in the workplace

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	6	Writing	6	Numeracy	6
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Employability Skills**3)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Application of the Unit**4)**

This unit applies to any recognised development program that leads to the acquisition of a formal award at AQF level 6.

Competency Field**5)**

Computer Systems

ELEMENT**PERFORMANCE CRITERIA**

6) Elements describe the essential outcomes of a unit of competency

Performance criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.

1 Prepare to install, configure and manage a virtual server environment.

1.1 OHS processes and procedures for a given work area are identified, obtained and understood.

1.2 Follow established OHS risk control measures and procedures in preparation for the work.

1.3 Determine the extent of the virtual server environment to be deployed from network performance specifications and in consultation with relevant persons.

1.4 Plan activities to meet scheduled time lines in consultation with others involved in the work.

1.5 Select appropriate hardware requirements and software based on specified requirements and performance standards.

1.6 Implement strategies to ensure the virtual server environment deployment is carried out efficiently.

1.7 Design the specification for the virtual server environment using information obtained from the analysis and evaluations of enterprise business and technical requirements. (See note 1).

		1.8	Analyse virtual server environment design specification in collaboration with a person of higher authority.
		1.9	Alter the virtual server environment design based on the collaboration and the constraints of the organisation's policy.
2	Install, configure and manage a virtual server environment.	2.1	Apply knowledge of the complexities of a virtual server environment to the installation.
		2.2	Install and configure the required hardware components of the virtual server environment in compliance with industry standards and variants as specified in the design. (See note 2).
		2.3	Install and configure software components of the virtual server environment in compliance with current industry practices and to conform to the requirements specified in the design. (See note 3).
		2.4	Configure networking for the virtual server environment in accordance with the network design and current industry practice.
		2.5	Migrate virtual machines as required by the design in accordance with current industry practice drawing upon extensive knowledge of complex virtual server environments.
		2.6	Analyse the virtual server environment's performance using current industry practices and monitoring tools with respect to overall environment performance and planning for scalability.
		2.7	Alterations to the network design resulting from the presentation/discussion are negotiated with person(s) of higher authority within the constraints of organisation's policy.
		2.8	Manage the virtual server environment update tasks in accordance with current industry practices and the environment's design documentation.
		2.9	Deploy strategies to ensure high availability in accordance with the design goals for the environment and to maximise data protection.

3	Document installation, configuration and management activities	3.1	Produce written justification for virtual server environment solutions and forward to appropriate person/s in accordance with established procedures.
		3.2	Maintain virtual server environment installation, configuration and management records in accordance with established procedures.

Notes.

1. Examples are company size, user and resource distribution, various site connectivity, bandwidth, service performance, availability and scalability, data and system access patterns, network roles and responsibilities and security considerations
2. Hardware components may include server hardware, storage area networks, network infrastructure components, fault tolerant power systems.
3. Software components may include hypervisor software such as Hyper-V, Vmware, Virtualbox, Operating System software for server platforms such as Windows Server, Unix, Linux, OS X Server, management tools including tools required for monitoring, analysis and managing high availability and data protection.

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe work practices and designing and managing enterprise networks.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

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Evidence shall show an understanding of virtual server environment processes to an extent indicated by the following aspects:

- a) Virtualisation:
 1. Hypervisors
 2. Virtual machines
 3. Server, network and storage virtualisation
 4. Cloud architectures
 5. Hypervisor user interfaces
 - b) Virtual Machines:
 1. Virtual switching architectures
 2. Virtual switch properties
 3. Virtual switch load balancing algorithms
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- c) Managing Virtual Storage:
 - 1. Virtual storage protocols and device names
 - 2. Storage Architectures
 - 3. Data stores
 - 4. Storage appliances
 - d) Virtual Machine Management:
 - 1. Virtual machine templates and cloning
 - 2. Modify and manage virtual machines
 - 3. Virtual machine snapshots
 - 4. Virtual machine migrations
 - 5. Virtual application provision
 - e) Data Protection:
 - 1. Business continuity
 - 2. Backing up virtual machines
 - 3. Data recovery appliances
 - f) Access and Authentication:
 - 1. Control user access
 - i. Roles
 - ii. Permissions
 - 2. Firewalls
 - 3. Integration with directory services
 - g) Resource Management and Monitoring:
 - 1. Virtual CPU and memory optimisation
 - 2. Resource pools
 - 3. Monitoring tools
 - i. Real time monitoring
 - ii. Logged monitoring
 - iii. Alarms
 - h) High Availability and Fault Tolerance:
 - 1. High availability architectures
 - 2. High availability clusters
 - 3. Fault tolerance
 - i) Scalability:
 - 1. Distributed resource scheduling
 - 2. Enhanced compatibility
 - j) Patch Management:
 - 1. Update management strategies
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2. Patch baselines
 3. Scanning and remediation
- k) Virtual Environment Components:
1. Hypervisor installation
 2. Storage Area Network booting
 3. Server deployment options
 4. Hardware, software and database requirements

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation the installation, configuration and management of any energy sector enterprise virtual server environment consisting of a complex virtualised environment, including virtual networking, storage resources and multiple server nodes providing users with a range of services in accordance with current industry requirements.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with

industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgement.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the time frames typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
 - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
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- Demonstrate an appropriate level of skills enabling employment
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
 - Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Install, configure and manage virtual server environments as described in 8) and including:

installation, configuration and management of virtual server components, networking in a virtualised environment, migration of virtual machines, managing the virtual server infrastructure, monitoring resource usage, planning for scalability, managing updates, managing higher availability and data protection, and documenting all installation, configuration and management activities

- A Analysing business requirements.
- B Analysing technical requirements.
- C Obtaining approval for virtual server environment design specifications.
- D Planning virtual server environment services.
- E Designing an enterprise virtual server environment in accordance with specifications and current industry practices.
- E Installing, configuring and managing a virtual server environment in accordance with the design.
- F Detailed analysis of network performance including monitoring virtual resource usage and planning for scalability.
- G Manage updates, high availability and data protection.
- H Documenting justification for network solutions.
- I Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor certification may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

for assessment	<p>This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:</p> <ul style="list-style-type: none"> • OHS policy and work procedures and instructions. • Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit. <p>These should be used in the formal learning/assessment environment.</p> <p>Note:</p> <p>Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.</p> <p>The resources used for assessment should reflect current industry practices in relation to the installation, configuration and management of virtual server environments.</p>
Method of assessment	<p>9.4)</p> <p>This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.</p> <p>Note:</p> <p>Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.</p>
Concurrent assessment and relationship with other units	<p>9.5)</p> <p>There are no concurrent assessment recommendations for this unit.</p>
